

STEM Task Force Study Group #2: **Create incentives and a supportive environment for students, teachers and institutions that pursue, succeed, and excel in STEM disciplines throughout the P-20 pipeline.**

Strategy	Objectives to Achieve Strategy	Accountability & Assessment (Responsible Person/Agency)	Timeline for Completion	Funding Source/Estimated Cost
#1 Investigate differential investment for STEM subjects including but not limited to <b>b) technology infrastructure, c) laboratory equipment, d) discretionary funding, e) supplies, and f) field trips.</b>	Develop state-wide regional "Hubs" at the universities/colleges which would provide expertise regarding laboratory space, supplies, and technology needs and utilization for their regional schools.	University "Hub"	2009-2010 Academic Year	State Legislature CPE/\$1,000,000
	Develop mobile labs containing necessary equipment to be hub sites to rural schools and other necessary locations.	CPE/University "Hub"	2009-2010 Academic Year	State Legislature/Grant/Dept. of Energy/\$500,000
	Provide public/private partnership funding that schools could apply to for specific projects that are evidenced based and data driven.	CPE/Professional Organizations and University "Hub"	2009-2010 Academic Year	AMSP-like Grant/State Grant & University Support/\$1,500,000
	Develop state warehouse containing functional but used equipment.	CPE/Universities/Colleges	2009-2010 Academic Year	Grants/Universities/Colleges \$100,000
	Develop discretionary STEM funding to increase resources for field trips, technology and other STEM related items.	CPE	2009-2010 Academic Year	State Legislature/CPE \$400,000

<p>#1 Investigate differential investment for STEM subjects including but not limited to <b>a) differential Compensation, g) professional travel allowances, and h) mathematics and science coaches and mentors.</b></p>	<p>Create a consensus position regarding a comprehensive differential compensation system for P-12 education that encourages quality teaching in STEM disciplines but not limited to those disciplines. (The STEM task force should review and take action based upon a working group composed of the KSBA, KEA, KASS, Kentucky Chamber of Commerce, Prichard Committee, EPSB, KDE, and Secretary of Education.)</p>	<p>EPSB, KDE, General Assembly, Governor's office</p>	<p>Recommendations, fall 2007; legislation 2008</p>	
	<p><i>Objective:</i> Maintain the math emphasis and add a science emphasis to the existing Teacher Professional Growth Fund (KRS 156.553)</p> <ul style="list-style-type: none"> <li>o Increase the appropriation for the Fund so that adequate training is provided to all teachers in the area needing it. Educate teachers and school councils about current opportunities.</li> <li>o Review recommendations of the "teacher working conditions survey" to assess conditions affecting work environment; convene a special task force to make recommendations for implementation (EPSB).</li> </ul>	<p>EPSB, Partnership for Successful Schools, KSBA (teacher working conditions survey), General Assembly, Governor's office (Fund increases) KDE, KASC, KDE, KEA (educate teachers and councils about Fund opportunities)</p>	<p>Professional Growth fund Legislation prepared fall, 2007; and enacted 2008 session.</p> <p>Survey — winter, 2008; Task force-spring 2008 with action plan by fall 2008</p>	
	<p>Track efforts currently underway in</p>	<p>Center for Math</p>	<p>2008 legislative</p>	

	<p>the Center for Math Excellence (NKU) and expand those that are effective. Create a similar program to enhance science teaching.</p> <p>The State should provide funding for release time and training for STEM coaches and mentors, as well as compensation/ released time as appropriate for STEM coaches, mentors and mentees.</p> <p>Prepare legislation and budget for Center for Science Excellence.</p>	<p>Excellence (NKU) plus University of Louisville Center for Research in Mathematics and Science Teacher Development.</p> <p>General Assembly: prepare legislation and budget for Center for Science Excellence.</p>	session	
#2 Provide or expand instructional laboratory space and opportunities for hands-on experiments in every school, college, and university.	Conduct a survey of essential conditions to determine STEM classroom cost for all elementary and secondary schools.			
	Develop statewide guidelines for what STEM classrooms should include and contain at the elementary, middle and high school levels. Determine whether guidelines exist, and if only for new construction.			
	Provide enhanced professional development opportunities for STEM teachers at all levels of the K-12 system. Professional development to include hands on laboratory intensive training.			

<p>#3 Increase opportunities for students to gain exposure to STEM careers through the Individual Learning Plans (ILPs) process, Gifted Student Services Plans (GSSPs), mathematics and sciences competitions and clubs, internships, research assistantships, and other practical experiences outside the classroom.</p>	<p>Provide a repository of STEM opportunities for P-12 children by creating a state STEM website (possibly KYSTEM.org) to provide a comprehensive listing of opportunities, lesson plans, links, etc. Widely advertise the site.</p>	<p>EPSB, KDE, General Assembly, Governor's office</p>	<p>ASAP</p>	
	<p>Make STEM initiatives a point of emphasis for all Individual Learning Plans (ILPs) and Gifted Student Services Plans (GSSPs).</p>	<p>EPSB, KDE, General Assembly, Governor's office</p>	<p>ASAP</p>	
	<p>Coordinate efforts with all P-16 STEM related clubs and organizations by collecting contact information. Communicate with respective parties and arrange an organizational meeting, perhaps at a state conference.</p>	<p>EPSB, KDE, General Assembly, Governor's office</p>	<p>Recommendations, fall 2007; legislation 2008</p>	
<p>#4 Develop more home-grown Kentucky STEM talent by creating new college scholarships for STEM majors, including pre-service elementary as well as middle grades and secondary teachers with a minor or area of mathematics and/or science.</p>	<p>Provide intensive 2-year STEM teacher induction program for every teacher of mathematics or science patterned on the medical school residency program model.</p>			
	<p>Provide STEM grants to schools and universities for collaboration with school districts and individual schools (regional stewardship)</p>			
	<p>Provide a STEM grant for all elementary teachers who acquire a minor in a STEM discipline or complete a designated curriculum</p>			

	in a STEM discipline.			
	Provide a stem grant or release time for currently certified teachers' to go back to school to acquire STEM certification.			
	Petition US Congress to repeal Social Security offsets which penalize mid-career professionals from other fields who might be interested in STEM-related teaching.			
	Explore forgivable loans for students majoring in STEM disciplines who go into teaching.			
	Create a statewide STEM Board, administratively attached to the Council on Postsecondary Education, which would develop a comprehensive, statewide strategy and emphatically campaign for the STEM disciplines.			
	Create a Governor's STEM Scholars Research Program to include public and private institutions of higher learning as well as the private sector.			
#5 Maximize existing opportunities for students in the STEM pipeline.	Create a public awareness campaign to better inform students and parents about career	CPE	July – December 2008	\$1 million as per CPE budget request

	opportunities for STEM discipline degrees.			
	Monitor the annual number of federal SMART and Academic Competitiveness Grants awarded to KY students attending KY colleges and universities.	CPE	Annual	
	Publicize existing STEM awards, grants and scholarships available through KY's colleges and universities and KHEAA.	CPE & KHEAA		CPE Budge request as above institutional & KHEAA to develop targeted STEM marketing materials.
	Create an inventory of STEM-related initiatives in KY.	CPE	FY 2008	CPE Budget request of \$1 million to create a P-20 STEM department within CPE.
#6 Reduce student disincentives and increase incentives to take rigorous STEM courses through such strategies as revising KEES and Governors Scholarship.	Consider end of course examinations as a gatekeeper for additional KEES enhancement.			
	Maintain existing base KEES funding, but also provide additional KEES funding for a more rigorous curriculum, AP, IB courses and a Commonwealth Diploma.			
	Maintain existing base KEES college related funding and then provide additional KEES funding for a STEM major or minor degree.			

<p>#7 Encourage better advising by middle and high school guidance counselors, teachers, and school leaders to better understand the critical importance of STEM subjects to future employment opportunities.</p>	<p>Target students early who show success and interest in STEM areas.</p> <ul style="list-style-type: none"> <li>Develop a list serve (counselor's organization) and web site to communicate to elementary, middle, and high school personnel information on the reasons and the how's to direct their students toward a STEM-related preparation in school as well as careers.</li> </ul>	<p>CPE and University "Hub" along with STEM coordinators in each of the "Hubs" that would work with school districts across the state.</p>	<p>2008-2009 Academic Year</p>	<p>CPE/\$20,000</p>
	<p>Ensure statewide access to "science-fair" concept, but with direction from STEM personnel.</p> <ul style="list-style-type: none"> <li>Develop a concept of the Universities/Colleges serving as a "Hub" for regional distribution of information as well as providing resources for potential STEM students and their teachers. Establish a STEM coordinator in each of the hub sites that would work with school districts across the state.</li> </ul>	<p>University "Hub"</p>	<p>2009-2010 Academic Year</p>	<p>State Legislature/State Grant/\$500,000</p>
	<p>Develop a program of using professionals in STEM fields, university personnel, and undergraduates in STEM areas in K-12 outreach.</p> <ul style="list-style-type: none"> <li>Contact professional organizations and Universities/Colleges for setting up</li> </ul>	<p>Professional Organizations and University "Hub"</p>	<p>2009-2010 Academic Year</p>	<p>State Grant &amp; University Support/\$500,000</p>

	speakers and field trips. Reduce impediments for college faculty to teach in high schools without requiring additional certification. Optional team-teaching, could be included in regional stewardship.			
#8 Collaborate with the Kentucky Community and Technical College System (KCTCS) to encourage STEM certificate students to pursue STEM degrees.	Create STEM certificate(s) to provide additional students in STEM pipeline.	KCTCS	Fall 2007	
	Seek funding to make available all levels of calculus on-ground or via distance learning.	KCTCS	Fall 2008	
	Create a pre-engineering pathway that will be accepted by all public universities' engineering programs (including a common course catalog numbering system).	KCTCS	2008-09	
	Seek funding for joint faculty appointments with public universities to include four regions of the state.	KCTCS	Spring 2009	
	Create a special transfer initiative for the STEM disciplines including 2+2 agreements.	KCTCS & CPE	Fall 2009	
	Explore with ABET the expansion of the STEM pipeline to include engineering technology.	KCTCS	Fall 2009	



